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STUDY OF THE MARINE ENVIRONMENT OF THE NORTHERN
GULF OF CALIFORNIA

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NASA Contract Number: NAS5-21777

GSFC ID Number: UN-603

ERTS-A Proposal Number: SR-102

Type I Progress Report for period ending July 31, 1972

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The primary objective of this investigation is to develop baseline information for use in interpretation of high-altitude flight data which will then be used to evaluate the feasibility of ERTS-A monitoring of seasonal changes in the northern Gulf of California environment. In order to achieve this objective, a large proportion of the investigation will be devoted to the documentation of quantitative seasonal variations within the study area in salinity, 1-meter depth temperature, water clarity, bottom configuration, current patterns, and possibly primary productivity. In support of the primary objective, and of the ERTS program, technology will be developed to utilize the Data Collection System (DCS) developed by NASA, for in situ measurement of oceanographic parameters.

Much has been accomplished during these first two months of the investigation, chiefly toward reaching a state of readiness to receive and analyze ERTS-A data and toward setting up and operationally beginning our three other phases of data collection. The accomplishments during this first reporting period are briefly summarized in the following numbered paragraphs:

1. Significant progress has been made toward sensor selection and procurement for the two remote data collection systems that will be deployed in the Gulf of California.
2. Work has begun on a data storage and retrieval plan which will facilitate comparative analysis among the four data sources, and will progressively maintain a master data inventory of all information gathered and analyzed as a result of this investigation.
3. In conjunction with the ARETS (Arizona Regional Ecological Test Site) office, an assessment of the work areas for photo interpretation, analysis instrumentation, and general facilities is being conducted, and will include recommendations for minor equipment needs, etc., both to the Principal Investigator and to the ARETS Coordinator.
4. Designs are completed and construction has begun on the first buoy platform which will house one of the remote data collection systems. Arrangements have been made for the final construction phases in Puerto Penasco, Sonora, Mexico.
5. In recent discussions with CONACYT (Consejo Nacional de Ciencia y Tecnologia) we have reached firm agreement in the following two areas:
a) Two scholarships, funded by Mexico, for remote sensing studies at the University of Arizona are being offered to two promising Mexican students. These graduate-level studies will be in conjunction with our ERTS-A investigation and will utilize both ground observation and aerial data. The first of the students, Captain Gustavo Calderon has already arrived, enrolled in a Master's Program, and is preparing for his work on receipt of the first ERTS-A data. b) CONACYT has agreed to serve as the central point of reference in regard to acquiring all necessary permits and letters for our work in Mexico; furthermore, CONACYT will act as the central agency for distribution of all satellite, aircraft, and ground data that will be collected in conjunction with this project.
6. We have succeeded in establishing clear lines of communication with the Comision Nacional del Espacio Exterior, CNEE, in Mexico. Through common agreement with both CONACYT and CNEE, it is recognized by all parties that any arguments which may occur concerning disposition of satellite, aerial, or ground data will be considered as "in-house" agency problems, which will not affect our current NASA project status.

7. An important relationship has been established with Oceanografia y Senalamiento Maritimo, and this agency has given their full support and recognition to our investigation, including support which will be instrumental in securing appropriate permission from the Mexican Department of Defense. Furthermore, the two data collection buoys will be registered and under the sponsorship of this agency and mention of them will be included in their monthly publication of "Advice to Mariners" (translation of title). Such recognition will insure freedom from legal problems which could conceivably occur, as well as providing security for our instrumentation similar to that given all other official Mexican Navy equipment. Responsibility for protection of our instrument platforms will become an official assignment of the Marine Police posts.
8. Through Oceanografia y Senalamiento Maritimo, a tentative commitment has been made of Mexican Navy ships to participate in our program. Specific mention has been made of a 140-foot converted mine sweeper which would deploy drogues for current studies, assist in deep sea measurements with equipment not available to us, and participate in various navigational fixes.
9. We have been promised the participation of two scientists from the National University of Mexico during our planned hydrographic cruises. Though the two scientists have not as yet been named, the commitment is firm and the projects have been defined (pesticide and shrimp larva distribution studies).
10. Preliminary negotiations have begun with the Universidad Autonoma de Baja California to formulate an inter-university agreement which would facilitate direct participation by their scientists in our marine projects, including the NASA program. Specifically, by late September, they will place a 34-foot diesel powered research vessel at San Felipe, Baja California. This vessel will carry scientists from both Universities on cruises that will become a part of the hydrographic cruise schedule now planned in our NASA program. The scientists from Mexico will study current patterns, bottom sediments and pesticide and heavy metal levels in the northern Gulf of California. In addition, at all times when this vessel is not occupied on the above-mentioned cruises, it will remain available to us for emergency charter, thus providing insurance that the hydrographic cruise schedule will be maintained, even in the case that our own vessel becomes unusable.
11. We have been invited by the SubSecretariat of Fisheries, in Mexico, to participate in a coordinated program of oceanographic data collection and exploration over the entire area encompassing Mexican territorial waters (which includes the entire Gulf of California). The University of Arizona would be given principal responsibility for the waters of the Gulf of California north of 30° latitude. It is hoped that our institution could provide expertise in the field of oceanographic applications of remote sensing techniques, including extensive application of the data to be collected in this investigation. The University of Arizona, as part of this program, may also be asked to take the lead in coordinating an ERTS-B project for the entire Gulf of California.

12. The Universidad de Sonora ship "Adventyr" has been moved from Guaymas to Puerto Penasco, center of our operations, and is presently being readied for our first research cruise. Modifications to provide more deck space working area, and selection of oceanographic equipment is also in progress. The ship, by arrangement with the Universidad de Sonora, will be at our disposal during the contract period.

With regard to changes in our standing order of data products, I am requesting, in addition to punched card format, the computer listings of all data from the two remote data collection platforms. Enclosed is Exhibit D reflecting this additional request.

No papers, articles, reports, abstracts, etc., have been published or released in conjunction with this investigation during the reporting period.

Work is conforming to the schedule as negotiated in the contract. We estimate that the remaining two months of the Phase I period should be adequate to finish the remaining preparatory work.

At this time we see no indications that the budgetary planning was short-sighted; it appears that the negotiated budget will be adequate to meet the requirements of the investigation.

During the next two months we plan to have two hydrographic cruises, one coincident with the first overflight of the test area. We also will finish construction of the first buoy, will order and hopefully receive the sensors for the remote data collection platforms, and, if the platforms arrive by August 15th (according to schedule), will begin installation of the sensors and signal conditioning electronics. We also hope to receive the first ERTS-A data and will complete the data analysis plan as called for in the contract.

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EXHIBIT D

I. DCP TYPE 1. (two inputs; digital-serial, analog)

quantity

delivery date(s)*

3

DCP TYPE 2. (two inputs; digital-serial, digital-parallel)

DCP TYPE 3. (three inputs; digital-serial, digital-parallel, analog)

TOTAL DCP's

SPARE MODULES:

TRANSMITTER CARD

PROGRAMMER CARD

ANALOG CARD

DIGITAL-PARALLEL CARD

OTHER (SPECIFY)

FIELD TEST SET

* If no delivery is specified above, a delivery date of no later than 15 August 1972 will be assumed.

II. DATA FORMAT REQUESTED: (To be supplied as available)

1. PUNCHED CARD ☒ 2. MAGNETIC TAPE ☐ 3. COMPUTER LISTING ☒

4. OTHER (specify)

New request